VERSION WITH MARKINGS TO SHOW CHANGES MADE

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Fig. 12 is an exploded view of the attachment mechanism of Fig. 10;

Figs. 13A and 13B are side elevation views illustrating the installation of the attachment mechanism of Fig. 11 on an item of equipment;

Figs. 14 and 15 are side elevational views of alternative embodiments of an attachment mechanism and an engagement mechanism;

Figs. 16A and 16B are respective perspective views of another alternative embodiment of an attachment mechanism and an engagement mechanism of the invention;

Fig. 16C is a side elevational view of the attachment mechanism and the engagement mechanism of Figs. 16A and 16B assembled together proximate the external wall of an item of equipment.

Fig. 17A is a side elevational view of another embodiment of the invention;

Fig. 17B is a corresponding perspective view of the embodiment of Fig. 17A;

Fig. 18 is a side elevational view of a slightly modified version of the embodiment of Figs. 17A and 17B showing a threaded engagement between the spindle and the housing;

Fig. 19 is a perspective view of another slightly modified version of the embodiment of Figs. 17A and 17B showing a pin and pin hole engagement between the attachment mechanism and the external wall of an item of equipment;

~~Fig. 20 is a perspective view of another embodiment of the invention having two engagement portions;~~

Figs. 20A, ~~21A,~~ 20B, ~~21B~~ and 20C ~~21C~~ are perspective views of component parts of another embodiment of the invention showing a separate attachment mechanism, housing, and engagement mechanism respectively;

Fig. 20D ~~21D~~ is perspective view of the embodiment of Figs. 20A, ~~21A~~ 20B, ~~21B~~ and 20C ~~21C~~ showing the three component parts in an assembled configuration;

Figs. 21A ~~22A~~ and 21B ~~22B~~ are perspective views of component parts of another embodiment of the invention showing an

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engagement mechanism and a separate attachment mechanism respectively;

Fig. 21C ~~22C~~ is a side elevational view of the embodiment of Figs. 22A and 22B with the engagement mechanism coupled to the attachment mechanism;

Figs. 22A ~~23A~~ and 22B ~~23B~~ are perspective views of slightly modified version of the respective component parts of Figs. 21A ~~22A~~ and 21B; ~~22B;~~

Fig. 22C ~~23C~~ is a side elevational view of the embodiment of Figs. 22A ~~23A~~ and 22B ~~23B~~ with the attachment mechanism shown coupled to a slot in the external wall of an item of equipment;

Fig. 23A ~~24A~~ is a side elevational view of an attachment mechanism coupled to an engagement mechanism according to another embodiment of the invention;

Fig. 23B ~~24B~~ is a perspective view of the embodiment of Fig. 23A ~~24A~~ with the attachment mechanism and engagement mechanism shown coupled to a cable and a separate locking device;

Fig. 24A ~~25A~~ is a perspective view of the attachment mechanism of Figs. 23A ~~24A~~ and 23B ~~24B~~ which can be directly coupled to an external wall of an item of equipment;

Fig. 24B ~~25B~~ is a perspective view of another embodiment of the attachment mechanism of Figs. 23A ~~24A~~ and 23B ~~24B~~ which can be directly coupled to an external wall with the use of an adhesive;

Fig. 25 ~~26~~ is another embodiment of an attachment mechanism which can be directly coupled to an external wall of an item of equipment;

Fig. 26A ~~27A~~ is a perspective view of another embodiment of the present invention with a conventional lock assembly and a retractable spindle;

Fig. 26B ~~27B~~ is a perspective view of the spindle and lock assembly of Fig. 26A ~~28A~~ showing the spindle in its retracted position; and;

~~Fig. 28 is a perspective view of a bracket assembly which can be used with the device of the embodiment of Fig. 20 to permanently lock the device to an item of equipment; and~~

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Fig. 27 ~~29~~ is perspective view of another embodiment of the preferred embodiment including a base unit and an attachment unit.

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inner surface of the external wall proximate the slot to prevent removal of the attachment mechanism from proximate the external wall. ~~In Fig. 20, a single body device 500 is shown mounted proximate external wall 550 which generally includes an attachment mechanism 501 comprising attachment member 502. Attachment member 502 broadly includes a closed top end 504, a bottom end 506, an outer peripheral edge wall 509, and spaced apart side walls 508. Side walls 508 have an aperture 510 therethrough which is sized to permit a cable (not shown) to pass through the aperture.~~

~~Engagement mechanism 520 is integral with bottom end 506 of attachment member 502 and generally includes engagement member 522. Engagement member 522 is preferably made from a resilient plastic material as is conventional in the art so that it can bend inward to fit within slot 552 and then spread back to a position within the slot in which engagement portion 524 engages the inner surface of external wall 550 proximate the slot. Engagement member 522 includes a shaft 528 and a based portion 524 connected to the distal end of shaft 528. Base portion 524 includes spaced apart side walls 526L, 526R on opposite sides of base portion 524. Side walls 526L, 526R are inwardly angled so as to facilitate access into slot 552.~~

~~To utilize device 500, a user firmly grasps side walls 508 of attachment member 502 and pushes downwardly so that side walls 526L, 526R of base portion 524 will engage slot 552 and bend slightly inward to fit within the slot. Once the base portion 524 of the engagement member is within the slot, with the shaft 528 occupying the slot, resilient side walls 526L, 526R will flex back to their natural configuration to thereby engage the inner surface of external wall 550 proximate the slot. In this configuration, the housing will be prevented from moving relative to the external wall. A cable (not shown) may then be inserted through aperture 510 to secure the attachment mechanism 501 to an immovable object (not shown).~~

~~Device 500 can also be used with the bracket assembly 560 of Fig. 28 as an alternative means to firmly secure device 500 proximate an external wall of an item of equipment. Bracket assembly 560 generally includes first and second,~~

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~~spaced apart resilient arms 562R and 562L on either side of the assembly having first and second, inwardly angled flanges 564R, 564L at the distal end of the arms. A pair of brackets 566 and 568 form the front and back end of assembly 560 and are used to guide device 500 into the bracket assembly. Bracket 568 has a rear flange 570 at the distal end of bracket 568 which forms a rear stop for device 500 when inserted into the bracket assembly 560.~~

~~In operation, base portion 524 of device 500 is inserted into bracket assembly 560 until side walls 526L, 526R engage with flanges 564L, 564R respectively. By applying sufficient downward force on device 500, side walls 526L and 526R will cause flanges 564L and 564R to flex apart slightly so as to permit movement of base portion 524 past the flanges. Movement of device 500 is subsequently limited by engagement of the bottom of base 524 with rear flange 570. In this position, removal of device is prevented by engagement of the upper surface of base 524 with the lower surfaces of flanges 564R and 564L.~~

Figs. 20A, ~~21A~~ 20B, ~~21B~~ 20C ~~21C~~ and 20D ~~21D~~ illustrate another embodiment of the invention 600 including three separate components, an attachment mechanism 602 (see Fig. 20A ~~21A~~), a housing 620 (see Fig. 20B ~~21B~~), and a separate engagement mechanism 640 (see Fig. 20C ~~21C~~). Attachment mechanism 602 includes attachment member 603 shown in an inverted position in Fig. 20A ~~21A~~. Attachment member 603 generally includes a top end 604, a bottom end 606, spaced apart side walls 608, and a peripheral edge wall 609. An aperture 610 is provided through side walls 608 and is sized to permit passage of a cable (not shown) through aperture 610. Base portion 612 is integrally connected to attachment member 603 proximate bottom end 606 of the attachment member. A retaining flange 614 is provided proximate top end 604 to retain attachment member 603 within housing 620, as will be described in more detail hereinafter.

Housing 620 is shown by way of reference to Fig. 20B ~~21B~~ and generally includes a top wall 622, a bottom wall 624, and four separate spaced apart side walls including a front end 626 and a back end 628. A pair of substantially rectangular openings 632 are provided through both top wall 622 and bottom wall 624 of the housing and are configured to allow passage of the attachment member 603 through openings 632. A separate, generally rectangular

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Engagement mechanism 640 is shown by way of reference to Fig. 20C ~~21C~~ and includes an engagement member 642. Engagement member 642 includes first and second, spaced apart engagement arms 646L, 646R which have first and second engagement portions 648L, 648R integrally connected to the arms at the distal end of arms 646L, 646R. A transverse member 644 connects the two engagement arms 646L, 646R together at the proximal end of the arms and defines an abutment surface 645 located towards the distal end of transverse member 644. Engagement arms 646L, 646R and transverse member 644 in combination define clearance space 649 which is sized to permit passage of attachment member 603 through clearance space 649, as will now be described.

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Figs. 21A, ~~22A~~ 21B, ~~22B~~ and 21C ~~22C~~ depict another embodiment of the invention, device 700, in which there are two major component parts, attachment mechanism 701 and engagement mechanism 720.

Attachment mechanism 701 of Fig. 21B ~~22B~~ generally includes an attachment member 702 having closed top end 704, a bottom end 706, a peripheral edge wall 709, and spaced apart side walls 708. An aperture 710 is provided through side walls 708 and is sized to permit a cable to pass through aperture 710. A generally rectangular opening 712 is further provided in bottom end 706 of attachment member 702 and extends the length of the attachment member to closed top end 704. Opening 712 is configured to accommodate passage of the engagement mechanism 720 into opening 712, as will be described in more detail hereinafter.

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Engagement mechanism 720 is shown by way of reference to Fig. 21A ~~22A~~ and generally includes engagement member 722 having first and second, spaced apart engagement arms 724L and 724R connected at the proximal end of engagement member 702 and defining a clearance space 725 between the arms sized large enough to permit a cable to pass through clearance space 725. Abutment surface 730 is located adjacent the proximal end of the engagement arms. Engagement portions 726L, 726R are integral with engagement arms 724L, 724R at the distal end of the arms. A pair of grooves 728 is provided in engagement portions 726L, 726R, with the length of the groove being substantially equal to the thickness of external wall 750 (see Fig. 21C) ~~22C~~. Engagement member 722 is preferably injection molded and made from a plastic material to enhance its resiliency. However, it is to be noted that the engagement member may be made from other materials, such as metal, provided that the material is sufficiently resilient to allow engagement arms 724L, 724R to be bent inward sufficiently far enough to allow engagement portions 726L, 726R to be inserted into slot 752.

To utilize device 700, engagement arms 724L, 724R are pressed towards one another so that engagement portions 726L, 726R are positioned sufficiently close to one another to allow the engagement portions to be inserted into slot 752. As seen in Fig. 21C, ~~22C~~ grooves 728 engage with external wall 750 when engagement portions 726L, 726R are within slot 752 and have spread back to their natural configuration. In this way, engagement member 722 is firmly secured to external wall 750. Subsequently, attachment member 702 is positioned over engagement member 722 until clearance space 725 is aligned with aperture 710 in the housing. In this configuration, a cable 740 can easily be threaded through aperture 710 in the housing and clearance space 725, and the presence of the cable 740 prevents attachment member 702 from being separated from engagement member 722.

Figs. 22A, ~~23A~~ 22B, ~~23B~~ and 22C ~~23C~~ illustrate a slightly modified version of the embodiment of Figs. 21A, ~~22A~~ 21B, ~~22B~~ and 21C ~~22C~~. In this embodiment, housing 702' preferably includes a retaining pin hole 714. Engagement mechanism 720' is also slightly modified to include a retaining pin 734 which engages with pin hole 714 proximate bottom end 706' of housing 702' to prevent engagement member 722' from being separated from housing 702' prior to insertion of a cable (not shown). Side walls 732L, 732R forming part of

alternative engagement portions 726L', 726R' will spread back to their natural configuration once inserted into slot 752 to thereby engage the inner surface of external wall 750 proximate the slot to affix the engagement member to the external wall. Engagement member 722' of Figs. 22A ~~23A~~ and 22C ~~22C~~ is adapted to engage with a slot having substantially smaller peripheral dimensions than the slot necessary to engage with engagement member 722 of Fig. 21A ~~22A~~.

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Figs. 23A ~~24A~~ and 23B ~~24B~~ illustrate another embodiment of the invention 800 in which there are also substantially only two component parts, an attachment mechanism 801 and an engagement mechanism 820. Attachment mechanism 801, shown by way of reference to Fig. 23A ~~24A~~, generally includes an attachment member 802 having a top end 804, a bottom end 806, and a cylindrical side wall 808. A pair of apertures 810 are provided through side wall 808 and are sized to permit a cable 840 to pass through apertures 810 (see Fig. 23B ~~24B~~). A generally cylindrical opening 812 is further provided in top end 804 of attachment member 802 and extends the length of the attachment member to a substantially smaller screw opening 814 in bottom end 806 of the attachment member. Opening 812 is configured to accommodate passage of screw 816 through opening 812 to bottom end 806 of the attachment member, as will be described in more detail hereinafter.

Engagement mechanism 820 is used in conjunction with attachment member 802, as is also illustrated in Fig. 23A ~~24A~~. Engagement mechanism 820 generally includes engagement member 822 having first and second, spaced apart engagement arms 824L and 824R connected to base portion 830 at the proximal end of engagement member 822 and defining a clearance space 825 between the arms sized large enough to permit screw 816 to pass through clearance space 825. Base portion 830 has a top surface 833 and a bottom surface 831 and is provided with a screw hole 832 through the surfaces. Engagement portions 826L, 826R are integral with engagement arms 824L, 826R at the distal end of the arms. In the preferred embodiment of device 800, engagement portions 826L, ~~824L~~ 826R have inwardly sloped side walls which facilitate insertion of the engagement portions into slot 852, as previously described.

In operation, engagement portions 826L, 826R are inserted into slot 852 until lower surface 831 of base portion 830 engages the outer surface of external wall 850. In this position of engagement member 822, attachment member 802 is positioned proximate upper surface 833 of base portion 830 until screw hole 832 is aligned with opening 814 in the attachment member. Screw 816 is then inserted through each of opening 812 in the attachment member, opening 814 at the bottom end 806 of the housing, hole 832 in base portion 830, and clearance space 825. The screw will force engagement arms 824L, 824R to spread apart so

that engagement portions 826L, 826R will engage the inner surface of external wall 850 proximate slot 852. In this configuration, cable 840 (see Fig. 23B ~~24B~~) can be threaded through apertures 810 in the attachment member and attached to an external object, such a lock 860, to secure the attachment member to the lock. The cable will also prevent removal of screw 816.

It is to be understood that an attachment member 802' can be used independently of engagement mechanism 820 provided that an appropriate screw hole or screw insert is provided in the external wall (not shown) sized to permit screw 816' to engage with the hole (or insert), as is apparent from Fig. 24A ~~25A~~. Further, an attachment member 802" may also be secured to an external wall by any other suitable engagement means, as for example providing a double-sided adhesive pad 870 for engaging both the bottom end of the attachment member 802" and the outer surface of the wall (not shown), as seen in Fig. 24B ~~25B~~.

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The attachment mechanism concept of Figs. 24A and 24B can also be modified to include a conventional lock assembly 910 (as previously described by way of reference to the embodiment of Fig. 2) in combination with a retractable spindle arm 908. As illustrated in Fig. 26A ~~27A~~, attachment mechanism 900 is affixed to one end of a cable 920 which has a closed loop 922 at its other end. Cable 920 is first wrapped around a relatively immovable object (not shown) and attachment mechanism 900 is passed through loop 922 and attached to the item to be protected such as external wall 950 to make it difficult to steal.

Attachment mechanism 900 is shown in its retracted position in Fig. 26B ~~27B~~ and generally includes a housing 902 and first and second, resilient engagement arms 904L and 904R which are mounted to the bottom end of housing 902 and extend outwardly therefrom. Engagement arms 904L, 904R have first and second, inwardly angled engagement portions 906L and 906R at the distal end of each of the arms which are configured so as to be easily received within slot 952 in the retracted position of spindle arm 908, as will be described in more detail hereinafter. At the other end of housing 902 from the engagement arms is a conventional cylindrical lock assembly 910, an example of which was described in detail by reference to Fig. 13B. A spindle arm 908 is adapted to be mounted to cylindrical lock assembly 910 at one end, with the opposite end of arm 908 extending between engagement arms 904L and 904R external of housing 902. Spindle arm 908 is connected to lock assembly 910 in such a manner that rotation of lock assembly 910 with an approximate key (not shown) will cause translational movement of spindle arm 908 in the direction of arrow 930 (see Fig. 26B ~~27B~~). This movement of arm 908 can be accomplished in any manner as is well known in the art, as for example having spindle arm 908 received within a corkscrew shape cam attachment mounted to lock assembly 910 so that rotation of the lock will cause corresponding translational movement of spindle arm 908.

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In operation, with spindle arm 908 in the retracted position of Fig. 26B ~~27B~~, engagement portions 906L and 906R are insertable into slot 952. Once inside of slot 952, a key can be inserted into lock assembly 910 and rotated so that spindle arm 908 will be moved in the direction of arrow 930 to its extracted position. The movement of spindle arm 930 along arrow 930 permits engagement arms 904L and 904R to flex outwards in the direction of arrow 940 so that engagement portions 906L and 906R will move outwards to engage the inner surface of slot 952. In this way, attachment mechanism 900 will be secured proximate external wall 950. To subsequently detach attachment mechanism 900 from proximate external wall 950, the appropriate key is reinserted into lock assembly 910 and rotated to retract spindle arm 908. This will cause engagement arms 904L, 904R to relax back to their natural configuration of Fig. 26B ~~27B~~ to thereby permit engagement portions 906L, 906R to be separated from slot 952.

Fig. 27 ~~29~~ is a perspective view of an alternate preferred embodiment of the present invention. There are occasions that cables and locks are inappropriate or a certain amount of mobility for protected equipment is necessary. In those instances, using a proximity detecting system 980 can protect portable computer equipment. Proximity detecting system 980 includes a base unit 982 and a remote unit 984 relatively permanently attached to monitor 14 by use of a standardized slot 72 (as shown in Fig. 5 for example). The various embodiments shown in Figs. 1-27 ~~28~~ provided examples of different attachment schemes for remote unit 984. Base unit 982 and remote unit 984 operate together to control a separation distance between them. There are many different ways to implement proximity detecting system 980 as well known in the art. One way provides base unit 982 with a transmitter for periodically transmitting a signal to remote unit 984.